REMARKS

Claims 1, 2, 5-7 and 9-26 and new Claims 27 and 28 remain active in the case. Reconsideration is respectfully requested.

The present invention relates to a battery that is light in weight and has a high discharge current at a high current density.

Claim Amendments

Claim 1 has been amended so that it conforms in language of Claim 15 by stating that the filler in the adhesive resin layer provides passages through the resin layer through which ions pass. Several other claims have been amended to make minor improvements in the language of the claims. Entry of the amendments into the record is respectfully requested.

New Claims 27 and 28 are supported by the paragraph bridging pages 12 and 13 of the specification.

Invention

The objective achieved in the present invention is a light weight and thin battery that exhibits improved battery characteristics with improved internal adhesive strength. As claimed, the battery comprises a battery body comprising a positive electrode and a negative electrode each containing an active material, a separator holding an electrolyte, and an adhesive resin layer joining at least one of the positive and the negative electrodes to the separator, wherein the adhesive resin layer comprises at least one layer and particles of a filler, the filler in the adhesive resin layer providing passages through the resin layer (through holes) through which ions pass.

Prior Art Rejection

Claims 1, 2, 5, 7 and 9-11 stand rejected based on 35 USC 102(b) as anticipated by Dasgupta et al '389. This ground of rejection is respectfully traversed.

It is clear that the Dasgupta et al patent represents relevant prior art because it discloses a non-aqueous, thin film rechargeable lithium battery. Although the patent discloses battery construction in which at least one adhesive layer is positioned between the electrolyte and each of the two electrodes of the cell. The adhesive layer contains a lithium compound as noted by the Examiner. This compound is $LiPF_6$ which is used in most commercially sold lithium batteries. However, the lithium compound, contrary to the statement by the Examiner, is **not a filler, nor does it function as a filler**. Moreover, the reference does not teach that the adhesive layer is porous. The objective of the invention disclosed in the patent is to enhance the ion conductivity of the layer by the lithium compound which serves as an electrolyte salt. In this context, as noted above, there is no teaching in the reference that the lithium compound renders the adhesive layer porous thereby providing through holes or passages through which ions pass. Dasgupta et al is silent as to a porous layer and the significance of such. Rather, the lithium compound functions as an electrolyte even though it is present in the adhesive layer in that it, along with the centrally located electrolyte, allows the movement of lithium ions between the opposing electrodes. In the present invention, on the other hand, the filler in the adhesive layer, which is usually a chemically inert metal oxide such as alumina or silica, remains undissolved in the adhesive layer. The presence of the filler particles increases the internal gaps within the layer, thereby facilitating the passage of ions through the adhesive layer. Accordingly, the Dasgupta et al patent fails to anticipate the invention as claimed and withdrawal of the rejection

is respectfully requested.

Claims 1, 2, 5, 7, 9-11 and 13 stand rejected based on 35 USC 102(b) as anticipated by Dasgupta et al '489. This ground of rejection is respectfully traversed.

The comments presented above with respect to the Dasgupta et al '389 patent apply equally as well to the Dasgupta et al '489 patent. Adhesive coating layer 9 of the disclosed battery is said to contain a lithium ion containing compound, again the most likely compound being $LiPF_6$. Accordingly, the adhesive layer that is disclosed does **not** contain a filler, but rather contains a dissolvable electrolyte. The adhesive layer of the patent does not contain filler particles which provide physical passage of lithium ions through the layer, thereby facilitating the movement of lithium ions within the battery. In fact, there is no teaching in the patent that the lithium ions render the adhesive layer porous thereby providing through holes in the layer. Accordingly, the reference does not anticipate the invention and withdrawal of the anticipatory ground of rejection is requested.

Claims 1, 2, 5, 7 and 9-12 stand rejected based on 35 USC 102(e) as anticipated by Chen et al '609. This ground of rejection is respectfully traversed.

Much the same arguments presented above with respect to the two Dasgupta et al patents pertain to the rejection of the claims in view of the Chen et al patent. Adhesive material layers 20 and 30 are shown that are said to contain electrolyte active species, and such electrolyte compounds are disclosed at column 4, lines 11-33 of the patent. Again these compounds are dissolvable electrolyte compounds and are not chemically inert filler particles. In fact, the reference fails to disclose the presence of a filler, although the patent teaches that the adhesive material may be porous (column 3, lines 37-39). However, because the material is not provided

with a filler, the extent or degree of porosity of the material is small. Moreover, even though porosity is mentioned in the patent, there is no disclosure in the reference as to the significance of porosity. Chen et al further teaches that the layer of the adhesive material may include an active electrolyte species, whether the material is polymeric or some other material (col 3, lines 36-37). However, the objective here is the same as in the above discussed Dasgupta et al patent of enhancing the ion conductivity of the adhesive layer by incorporating an electrolyte salt in the adhesive layer. Clearly, the patent does not teach or suggest that the presence of the electrolyte salt renders the adhesive layer porous or has the function of providing the layer with through holes. Thus, the reference fails to teach or suggest the adhesive layer component of the present battery which contains a filler component to facilitate the passage of lithium ions between the electrodes via the intermediate electrolyte layer. Accordingly, the anticipatory ground of rejection is believed to fail and withdrawal of the rejection is respectfully requested.

Claims 1, 2, 5, 7 and 9-12 stand rejected based on 35 USC 102(e) as anticipated by Hamano et al '061. This ground of rejection is respectfully traversed.

The Hamano et al patent discloses a secondary lithium ion battery which in part contains porous adhesive layers 11 that bond the electrolyte layer to the negative and positive electrodes. Although the adhesive layers are indicated as being porous, i. e., the layers contain through holes, the porosity is developed by the evaporation of the solvent NMP (N-methylpyrrolidone) from the adhesive layer material (see column 9, lines 6-15). There is absolutely no teaching or suggestion of an adhesive layer containing filler particles which increase passage spaces within the adhesive layer for the passage of lithium ions therethrough. Because the reference does not teach the use of a filler in the adhesive layer, it is impossible to form many through holes in the

layer. That is, the porosity of the layer is low. Accordingly, the anticipatory ground of rejection is believed overcome and withdrawal of the rejection is respectfully requested.

Claims 1, 2, 5, 7, 9-12, 15, 16, 19, 21-24 and 26 stand rejected based on 35 USC 102(e) as anticipated by Kawakami et al '434. This ground of rejection is respectfully traversed.

Although the Kawakami et al patent discloses a secondary battery that contains an insulating layer, there is no teaching or suggestion in the reference of an adhesive layer that binds

an electrode to an intermediate electrolyte layer, and certainly no teaching or suggestion of an adhesive layer that contains chemically inert filler particles whose purpose is to provide the adhesive layer with passages through which lithium ions may pass to facilitate operation of the cell. The patent discloses both inorganic and organic materials as insulating layer materials. None of these materials is indicated as an organic adhesive material. Accordingly, Kawakami et al fails to anticipate the invention as claimed and withdrawal of the rejection is respectfully requested.

Claim 12 stands rejected based on 35 USC 103(a) as obvious over Dasgupta et al '389 in view of Hamano et al '061. This ground of rejection is respectfully traversed.

As is clear from the discussion above, neither Dasgupta et al nor Hamano et al contain any teaching or suggestion of the distinguishing feature of the present invention which is the adhesive layer that contains filler particles. Accordingly, since Claim 12 is ultimately dependent upon Claim 1, it is clear that a battery containing positive and negative electrodes between rolled separators, that also contains at least one adhesive layer containing filler particles therebetween, is also not shown or suggested by the combined disclosures. Accordingly, the combined patents

fail to obviate the invention as claimed and withdrawal of the rejection is respectfully requested.

Claims 1, 2, 5-7 and 9-26 stand rejected based on the judicially created doctrine of obviousness-type double patenting in view of Claims 1-23 of U.S. Patent 6,387,565. This ground of rejection is believed obviated by the filing of the enclosed Terminal Disclaimer.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Norman F. Oblon
Attorney of Record
Registration No.: 24,618

Frederick D. Vastine, Ph.D.
Registration No.: 27,013

Customer Number
22850

TEL: 703-413-3000
FAX: 703-413-2220